Food shoppers' nutrition attitudes and relationship to dietary and lifestyle practices

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Abstract

The study compared dietary and lifestyle practices of 5689 adults in the US Department of Agriculture's Diet and Health Knowledge Survey conducted in 1994 to 1996. The adults were grouped based on their attitudes toward the importance of nutrition when buying food. A high percentage of women (69.8%) than men (55.2%) reported that nutrition was very important to them when buying food. Household income and educational status did not affect their nutrition attitude. After controlling for age, sex, and other socioeconomic and demographic variables, adults who considered nutrition very important had a lower energy intake and consumed more nutritious foods such as fruits, nonstarchy vegetables, and fluid milk than their counterparts. They read food labels and adopted several dietary fat reduction strategies. The adults who did not consider nutrition very important were 21% more likely to watch television for more than 2 hours a day, 38% more likely to be a smoker, and 32% less likely to exercise. In conclusion, the adults who placed importance on nutrition were also likely to practice a healthful lifestyle. Health interventions should include a nutrition component emphasizing the importance of good nutrition.
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Keywords: Nutrition attitudes; Food shopping; Lifestyle; Diet quality; Fast food; Total fat; Added sugars; Exercise; Television viewing; Smoking

1. Introduction

Diet is one of the major factors influencing health. Nondietary factors influencing health include physical activity and exercise, television watching and other sedentary practices, and

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smoking and tobacco use. Obesity, certain forms of cancer, cardiovascular disease, type 2 diabetes, and osteoporosis are some of the health conditions attributable to poor dietary intakes and lifestyle practices [1-7]. Therefore, it is important to understand the link between dietary and lifestyle practices.

This study examined the association between adults' attitude toward nutrition and their nutrition knowledge, food label use, dietary intake, and other dietary behaviors, and lifestyle practices. The objective of the study was to find out whether adults in the US Department of Agriculture's (USDA) national Diet and Health Knowledge Survey 1994 to 1996 (DHKS) [8], who considered nutrition very important when buying food, ate a more nutritious diet and practiced a healthful lifestyle than the adults who did not consider nutrition very important.

2. Methods

The study included adults, ages 20 years and over, in the USDA's DHKS 1994 to 1996. These adults had complete food intake records on day 1 of the Continuing Survey of Food Intakes by Individuals (CSFII 1994-1996). The USDA conducted the CSFII as a part of its national nutrition monitoring activities. Dietary intake data in the surveys were collected through an interviewer-administered 24-hour dietary recall using a multiple-pass technique to reduce underreporting by the respondents [9]. The survey also collected self-reported data on height, weight, physical activity, television viewing, and smoking status of the respondents. Overall day 1 response rate for the CSFII 1994 to 1996 was 80.0% [9].

The DHKS attempted to interview 1 adult from each CSFII household. Adults who provided complete dietary information to the interviewer were eligible to participate in the DHKS. The respondents whose dietary intake data were collected through proxy interviews, and respondents who were proxies were excluded from participating in the DHKS. Consequently, not all households had a DHKS respondent. The DHKS respondents were randomly selected from among the eligible CSFII respondents. The DHKS was administered through telephone. In-person interviews were conducted for households without telephones or when the telephone number was not available.

A DHKS question addressed the nutrition attitude of the respondents when buying food. They were asked how important nutrition was to them when they bought food. The possible responses were very important (N = 3686), somewhat important (N = 1685), not too important (N = 245), and not at all important (N = 73). Adults who considered nutrition very important when buying food were assigned to the first group, and all the others (N = 2003) were assigned to the second group.

2.1. Socioeconomic characteristics

The socioeconomic and demographic characteristics of the 2 nutrition attitude groups were analyzed (Table 1). A multiple logistic regression analysis was conducted to determine the association between nutrition attitudes when buying food and the socioeconomic and demographic characteristics of the population. Sex, age groups (20-39, 40-54, and 55 years and older), race/ethnicity (Hispanics, non-Hispanic whites or whites, non-Hispanic blacks or African Americans, and non-Hispanic other races such as Asians, Pacific Islanders, American Indians, and Alaskan natives), annual household income (0%-130% of poverty, 131%-350%

Table 1
Socioeconomic and demographic characteristics and multiple logistic regression analyses by nutrition attitude status

Socioeconomic and demographic groups	Percent distribution in the total population (N = 5689) (weighted %)	Adults who considered nutrition very important		Nutrition very important (yes = 3,686; no = 2,003)		
		Weighted %	95% CI	Odds ratio	95% Confidence limits	P value
Sex						
Women	52.1	69.8	67.6-72.0	1.00		
Men	47.9	55.2	52.4-58.0	0.54	0.46-0.64	<.0001
Age groups						
20-39 y	44.6	57.2	55.0-59.4	1.00		
40-54 y	26.8	62.6	59.1-62.8	1.33	1.12-1.57	.0014
55 y and older	28.7	71.6	69.6-74.2	1.97	1.70-2.28	<.0001
Race/ethnicity						
Whites	75.9	60.2	58.0-62.4	1.00		
African Americans	11.1	74.2	68.9-79.5	1.95	1.41-2.68	.0001
Non-Hispanic others[a]	4.0	57.8	47.4-68.2	1.05	0.68-1.61	.83
All Hispanics	8.9	72.6	66.2-79.0	2.05	1.50-2.80	<.0001
Household income						
0%-130% of poverty	15.6	66.7	62.7-70.7	1.00		
131%-350% of poverty	41.3	62.8	59.8-65.8	1.01	0.82-1.24	.93
Above 350% of poverty	43.1	61.3	58.7-63.9	1.00	0.82-1.23	.98
Region						
Northeast	20.2	67.5	62.7-72.3	1.00		
Midwest	23.3	59.7	56.3-63.1	0.75	0.58-0.97	.031
South	34.9	62.6	59.4-65.8	0.84	0.64-1.08	.17
West	21.6	62.0	58.8-65.2	0.81	0.64-1.03	.08

Probability values <.05 denote significant differences between the means.
 [a] Includes Asians, Pacific Islanders, American Indians, and Alaskan natives.

of poverty, and above 350% of poverty), and region (Northeast, Midwest, South, and West) were the independent variables in the multiple logistic regression model. Women, adult aged 20 to 39 years, whites, adults living in households with income below 130% of poverty, and adults living in Northeast were the reference categories in the logistic regression model.

2.2. Nutrition knowledge and food-shopping characteristics

The DHKS included a few questions on nutrition knowledge. The respondents were given names of several pairs of foods and were asked to identify from each pair, the food that was higher in total fat or saturated fat. Examples of questions on total fat included regular hamburger versus ground round, hot dogs versus ham, peanuts versus popcorn, and yogurt versus sour cream; and on saturated fat included liver versus T-bone steak, egg white versus egg yolk, and skim milk versus whole milk. The percentages of respondents who gave correct answers were estimated and compared. Also, food label use by the respondents was analyzed (Table 2).

2.3. Dietary practices, dietary intakes, and diet quality

The DHKS had many questions on the dietary practices of respondents. These questions addressed the use of discretionary fat and fat reduction strategies adopted by the respondents. The percentages of adults in response groups were estimated and compared (Table 3). Mean energy, macronutrients, food and beverage intakes, and nutrient densities (amount of nutrient per 1000 kcal [4200 kJ] of energy intake) were estimated from day 1

Table 2
Percentage of adults who often or always read food label information when buying food by nutrition attitude status

Information read often or always	Nutrition very important (weighted %)	Nutrition not very important (weighted %)	P value
List of ingredients	36.3 ± 1.00	15.0 ± 1.33	<.0001
The short phrases such as "low-fat," "light," or "good sources of fiber"	34.5 ± 1.13	15.6 ± 0.98	<.0001
The information about the size of the serving	28.5 ± 1.04	12.9 ± 1.10	<.0001
Calories	43.1 ± 1.23	23.9 ± 1.30	<.0001
Total fat	51.0 ± 1.23	24.4 ± 1.54	<.0001
Saturated fat	43.3 ± 0.96	19.9 ± 1.31	<.0001
Cholesterol	40.5 ± 1.03	17.6 ± 1.00	<.0001
Salt or sodium	36.8 ± 1.04	18.3 ± 1.27	<.0001
Fiber	23.7 ± 0.97	6.3 ± 0.70	<.0001
Sugars	33.0 ± 1.03	14.2 ± 1.22	<.0001
Dessert items such as cookies or cake mixes	26.6 ± 0.91	11.9 ± 0.80	<.0001
Snack items such as chips, popcorn, or pretzels	29.7 ± 0.93	15.5 ± 1.10	<.0001
Frozen dinners or main dishes	27.3 ± 0.79	16.4 ± 1.34	<.0001
Breakfast cereals	40.7 ± 1.32	19.2 ± 1.03	<.0001
Salad dressings	38.0 ± 1.14	18.2 ± 0.96	<.0001
Table spreads such as butter or margarine	34.5 ± 1.21	15.6 ± 1.15	<.0001
Processed meat products such as hot dogs and bologna	33.2 ± 1.10	17.0 ± 1.03	<.0001

Values are presented as mean percentages ± SEM.

Table 3
Eating behavior and beliefs of adults by nutrition attitude status

Dietary practices and beliefs	Response	Nutrition very important (weighted %)	Nutrition not very important (weighted %)	P value
When you eat cooked vegetables, other than potatoes, do you eat them with butter or margarine added?	Always	19.7 ± 1.09	24.5 ± 1.56	.0040
When you eat cooked vegetables, other than potatoes, do you eat them with butter or margarine added?	Never	22.1 ± 1.09	13.0 ± 1.10	<.0001
Would you describe the amount of butter or margarine you usually spread on bread or muffin as:	Generous	8.0 ± 0.44	14.9 ± 1.24	<.0001
When you eat chicken, do you eat it fried?	Always/Sometimes	47.6 ± 1.55	58.0 ± 2.10	.0001
When you eat chicken, do you eat it fried?	Never	19.8 ± 1.05	11.5 ± 1.09	<.0001
When you eat chicken do you remove the skin?	Always	51.3 ± 1.13	34.8 ± 1.47	<.0001
When you eat meat, do you usually eat:	Small portions	35.9 ± 1.22	22.8 ± 1.36	<.0001
When you eat meat, do you usually eat:	Large portions	8.3 ± 0.68	17.3 ± 1.00	<.0001
Eat chips such as potato chips or corn chips	Once or less than once a week	50.4 ± 1.4	35.5 ± 1.61	<.0001
Eat bakery products such as cakes, cookies, or donuts	Once or less than once a week	40.1 ± 1.23	28.8 ± 1.56	<.0001
Use skim or 1% milk instead of 2% or whole milk	Always	38.7 ± 1.21	30.6 ± 1.72	<.0001
Eat ice milk, frozen yogurt, or sherbet instead of ice cream	Always	21.0 ± 1.07	9.9 ± 0.97	<.0001
Eat fruit for dessert when eating dessert	Always	18.9 ± 1.07	7.3 ± 0.66	<.0001
Use low-calorie instead of regular salad dressing	Always	32.0 ± 1.17	19.0 ± 0.96	<.0001
Eat fish or poultry instead of meat	Always	21.0 ± 1.02	10.0 ± 0.85	<.0001
What you eat can make a big difference in your chance of getting a disease such as heart disease or cancer	Strongly agree	65.5 ± 1.15	53.2 ± 1.83	<.0001
There are so many recommendations about healthy ways to eat, it is hard to know what to believe	Strongly agree	39.6 ± 1.53	40.8 ± 1.71	.49
How important it is to you to maintain a healthy weight?	Very important	83.0 ± 1.29	56.5 ± 1.42	<.0001

Values are presented as mean percentages ± SEM.

dietary intake data using multiple regression models to control for the socioeconomic and demographic variables (Table 4).

The Healthy Eating Index (HEI) values were used to determine the overall diet quality [10,11]. The HEI is composed of 10 components and represents different aspects of a healthful diet. Components 1 to 5 measure how well a diet meets the Food Guide Pyramid recommendations for grain, vegetables, fruit, milk, and meat and meat alternates groups [12]. Eating the recommended number of servings is given 10 points, and not eating a food group

Table 4

Mean dietary intakes of adults by nutrition attitude status, adjusted for sex, age, race, household income, and demographic factors, day 1 data

Dietary intakes	Nutrition very important	Nutrition not very important	*P* value
Energy[a] (kcal)	2008 ± 20	2165 ± 40	.0007
Total fat (g)	75 ± 1	83 ± 2	.0001
Saturated fat (g)	25 ± 0.4	28 ± 0.6	<.0001
Total carbohydrate (g)	253 ± 3	264 ± 5	.06
Added sugars (g)	71 ± 2	86 ± 3	<.0001
Total fluid milk (g)	162 ± 6	136 ± 7	.005
Low-fat and skim milk (g)	119 ± 5	84 ± 7	<.0001
Nondiet carbonated beverages[b] (g)	218 ± 9	303 ± 20	<.0001
Fruits and fruit juices (g)	179 ± 7	140 ± 8	.0004
Nonstarchy vegetables (g)	146 ± 4	132 ± 5	.03
Total meat, poultry, and fish (g)	207 ± 4	239 ± 8	.0006
Dietary fiber/1000 kcal (g)	8.8 ± 0.09	7.7 ± 0.14	<.0001
Calcium/1000 kcal (mg)	393 ± 5	366 ± 5	<.0001
Magnesium/1000 kcal (mg)	148 ± 1	136 ± 2	<.0001
Zinc/1000 kcal (mg)	5.8 ± 0.09	5.5 ± 0.07	.006
Vitamin E/1000 kcal (mg α-tocopherol)	4.4 ± 0.09	4.0 ± 0.07	.006
Carotene/1000 kcal (μg retinal equivalents)	313 ± 12	259 ± 11	.001

Values are presented as mean ± SEM from the regression models. Probability values (asterisk) of <.05 denote significant differences between the means.

[a] 2008 kcal = 8406 kJ; 2165 kcal = 9063 kJ.

[b] Include all carbonated soft drinks except unsweetened and sugar-free types.

is given a zero score for the respective food group. Components 6 to 9 measure the compliance of one's diet to the Dietary Guidelines recommendations on total fat, saturated fat, cholesterol, and sodium [13]. Component 10 measures variety in a person's diet. Each component may assume a value from 0 to 10. The HEI is the sum of the 10 component scores. The maximum HEI score is 100. A "good-quality diet" is defined as having a HEI score above 80 points, and a "poor-quality diet" as having a score below 51 points [10].

The odds ratios for eating a good-quality diet or a poor-quality diet were estimated using multiple logistic regression models controlling for socioeconomic and demographic variables (Table 5). The adults who considered nutrition very important when buying food were the reference category in the multiple logistic regression models.

2.4. Lifestyle characteristics

Four lifestyle practices of the respondents were examined. They were fast-food consumption status on day 1, watching more than 2 hours of television or videotape on day 1, general exercise status, and current smoking status.

The CSFII 1994 to 1996 collected information on where the respondents obtained each food and beverage they reported consumed. The respondents were placed either in "ate fast food" group or "did not eat fast food" group depending upon whether they reported eating fast food on day 1 of the survey. The only question on physical activity asked the respondents

Table 5
Association between nutrition attitudes and diet quality and lifestyle practices of adults, adjusted for socioeconomic and demographic factors

	Nutrition very important[a]	Nutrition not very important			
	Odds ratio	Odds ratio	95% Lower limit	95% Upper limit	P value
Likely to eat a good diet	1.00	0.51	0.38	0.69	<.0001
Likely to eat a poor diet	1.00	1.27	1.04	1.56	.020
Likely to eat fast food	1.00	1.26	1.04	1.53	.020
Likely to watch more than 2-h television[b] in a day	1.00	1.21	1.02	1.44	.031
Likely to exercise	1.00	0.68	0.57	0.82	.0001
Likely current smoker	1.00	1.38	1.18	1.63	.0002

Probability values (asterisk) of <.05 denote significant differences between the 2 nutrition attitude groups.
  [a] Nutrition–very important was the reference category.
  [b] Includes television and videotape viewing.

how often they exercised vigorously enough to work up a sweat. Two exercise-status groups were created: "exercised twice or more times a week" and "infrequently or never exercised." For the television (or videotape) viewing practice, respondents were placed either in "watched more than 2 hours of television on day 1" group or in "watched no television or less than 2 hours' television on day 1" group. The 2 smoking status groups were "a current smoker" and "not a current smoker." The odds ratios for each lifestyle practice were estimated by using multiple logistic regression models controlling for the socioeconomic and demographic variables (Table 5).

Some adults may have considered nutrition very important because of their prevailing health conditions and/or because of their efforts to either lose or maintain body weight. The percentages of adults in each nutrition group who were told by their doctors that they had health conditions such as diabetes, heart disease, high blood pressure, or high blood cholesterol and the percentages of adults who considered maintaining a health weight was very important were estimated and compared. Mean body mass index and the percentage overweight adults in the 2 groups were compared within sex.

All the estimates reported in this study were computed using SAS callable (SAS release 8.2, 1999-2001, SAS Institute Inc, Cary, NC, USA) SUDAAN software (release 8.0.1, January 2002, Research Triangle Institute, Research Triangle Park, NC, USA). Survey design effects were used in the analyses. Therefore, all estimates reported in the study were weighted to represent the US population studied; $\alpha = 0.05$ apriori level of significance was chosen for all the regression analyses and other comparisons in the study.

3. Results

Socioeconomic and demographic characteristics of adults are in Table 1. Among the 5689 adults in the study, 62.8% said nutrition was very important to them when buying food. Men, as compared with women, were only about half as likely to consider nutrition very important. Adults 55 years and older were twice as likely to consider nutrition very important than

young adults. African Americans and Hispanics were twice as likely to view nutrition as very important than whites. Household income did not influence nutrition attitudes.

Further analyses of data showed that educational status of the respondents did not influence nutrition attitudes. In the study, 64% who had high school level or less than high school education, 61% who had 1 to 4 years' college education, and 62% who had 5 or more years of college education said that nutrition is very important when buying food.

There were no statistical differences in the nutrition knowledge of adults in the 2 nutrition attitude groups. The same percentages of adults from both groups correctly identified foods that were high in total fat or saturated fat from the food pairs listed. However, differences were seen in adults' food label use (Table 2). Compared with those who did not consider nutrition very important, about twice as many adults who considered nutrition very important read food label information on list of ingredients, serving size, and nutrient and caloric content. In contrast, only a small percentage of adults who did not consider nutrition very important read food label information.

There were striking differences in the dietary practices between the 2 groups (Table 3). A high percentage of adults who did not consider nutrition very important when food shopping added fat to cooked vegetables, used a generous amount of table fat on bread and muffins, ate fried chicken, and ate large portions of meat. Moreover, only a small percentage of them always used skim or 1% milk instead of whole or 2% milk; consumed ice milk, frozen yogurt, or sherbet instead of ice cream; ate fruit for dessert when eating dessert; and removed skin when eating chicken.

About two thirds of adults who considered nutrition very important and at least half the adults who did not consider nutrition very important strongly agreed that there was a relationship between what they ate and having health conditions such as heart disease and cancer (Table 3). However, equal percentages (40%) of adults from both groups agreed that there were many dietary recommendations, and it was hard to know what to believe (Table 3).

Further analyses showed very small, but statistically significant, differences in the health status of the 2 nutrition attitude groups. A slightly higher percentage of adults who considered nutrition very important than others said that a doctor had told them they had high blood pressure (23%, 95% confidence interval [CI] 20%-22% vs 18%, 95% CI 16%-20%), high blood cholesterol (15%, 95% CI 14%-16% vs 12%, 95% CI 10%-14%), diabetes (6.8%, 95% CI 5.8%-7.8% vs 4.3%, 95% CI: 3.5%- 4.1%), or heart disease (8%, 95% CI 7%-9% vs 6%, 95% CI 5%-7%). Also, significantly more adults who considered nutrition very important were on some type of diet. For example, 7.9% (95% CI 6.9%-8.9%) were on a weight loss diet, 10.3% (95% CI 9.1%-11.4%) were on a low-cholesterol diet, and 5.0% (95% CI 3.8%-6.2%) were on a low-salt or low-sodium diet. The respective percentages for the other group were 5.0% (95% CI 4.0%-6.0%), 5.6% (95% CI 3.8%-7.4%), and 2.6% (95% CI 1.6%-3.6%).

Although a high percentage of adults who considered nutrition very important also said that it was very important to maintain a healthy weight (Table 3), no significant differences were seen in the mean body mass index values of men and women in the 2 groups. Also, no significant differences were seen in the percentage overweight (61.5%) adults in the 2 nutrition attitude groups.

After controlling for age, sex, and other socioeconomic and demographic variables, the adults who considered nutrition not very important, compared with adults who considered nutrition very important, had 157 kcal (657.2 kJ) more energy intake on day 1 of the survey, of which 72 kcal (301.4 kJ) came from total fat and 60 cal (251.2 J) came from added sugars (Table 4). Only 62% of their fluid milk intake consisted of low-fat milk or skim milk. They drank 3 oz more nondiet carbonated beverage, which is a high source of added sugars. These adults also ate lower amounts of nutritious foods such as fruits, nonstarchy vegetables, and fluid milk than their counterparts. Consequently, their diet was low in micronutrient density (amount of micronutrient per 1000 kcal [4200 kJ] of energy intake).

Twenty-four percent of adults who considered nutrition important and 31% who did not consider nutrition very important reported eating fast food on day 1 of the survey. The adults who did not consider nutrition very important when buying food were less likely to eat a good-quality diet and more likely to eat a poor-quality diet (Table 5). Also, they were more likely to eat fast food, more likely to watch television (or videotape) for more than 2 hours a day, more likely to be a current smoker, and less likely to have a regular exercise pattern than their counterparts.

4. Discussion

In general, fewer men and young adults between ages 20 and 39 years and more women and adults ages 55 and older placed importance on nutrition when buying food. Household income and educational status did not affect the nutrition attitudes of the respondents. A reason for not seeing an association between household income and nutrition attitude may be caused by the fact that a high percent of African American and Hispanic adults considered nutrition very important. Further data analyses showed that one third of African Americans and one third of Hispanics in the study were from households with income below 131% of poverty as compared with only one tenth of whites who were in this income group.

The study showed more adults who considered nutrition very important reportedly having health conditions such as diabetes, high blood cholesterol, or hypertension than their counterparts. However, the differences in the percentages between the 2 nutrition attitude groups, although statistically significant, were small. Similarly, the differences in the percentages of adults, in the 2 groups, who were on some type of diet (weight loss, low-sodium or a low-fat diet), although statistically significant, were small. The DHKS did not ask the respondents why they did or did not consider nutrition very important. Therefore, it is difficult to postulate that health conditions might have influenced their nutrition attitudes. This is one of the limitations of this study.

Although health conditions may have played a role in some adults considering nutrition very important, having a health condition did not always result in eating a nutritious diet or in practicing a healthful lifestyle. For example, among adults who were 55 years or older, 14% in both nutrition attitude groups reported having diabetes, 20% having heart disease, and 40% to 45% said that they had high blood pressure. Also, among men and women, no appreciable differences were seen between the 2 nutrition attitude groups in the percentages of adults having diabetes, heart disease, or high blood pressure. Yet, a substantially high percentage of women (69.8%) than men (55.2%) considered nutrition very important. Other social and

psychological factors (beyond the scope of the survey data) may have also influenced the nutrition attitudes of adults either positively or negatively.

The adults who considered nutrition very important controlled their discretionary calorie intakes from total fat and added sugars. A high percentage read total fat and saturated fat information on food labels. A high percent of them also read labels of food products such as desserts and other snack foods, processed meat products such as hot dogs, and breakfast cereals that are generally high sources of fat and/or added sugars. Moreover, they adopted several dietary fat reduction strategies. For example, they reduced intakes of discretionary calories from fat by drinking low-fat milk or skim milk instead of whole milk. Seventy-three percent of their fluid milk intake was either low-fat milk or skim milk. In contrast, only 61% of total milk consumed by adults who did not consider nutrition very important was either low-fat or skim milk. The group that did not consider nutrition very important drank more nondiet soft drinks and therefore had a high intake of discretionary calories from added sugars. Nondiet soft drinks are the top source of added sugars in the US diet [14,15].

Those who considered nutrition not very important were more likely to eat fast food than the others. Eating fast food has been associated with having an energy-rich micronutrient-poor diet, which is also high in discretionary calories from fat and added sugars [16-18].

Choosing a diet low in nutrient-rich foods such as fruits, vegetables, and lean meat and low-fat dairy foods or high in discretionary calories from sugars and fat over a prolonged period may place an adult at risk for weight gain [2]. The prevalence of obesity in the United States continues to increase [19,20]. Therefore, choosing nutritious foods that are low in energy will help in weight management.

The adults who considered nutrition very important ate a better quality diet. Because of their high fruit and nonstarchy vegetable intake, their diet was low in energy and yet high in fiber and micronutrients density. Eating a diet low in energy and high in fiber is important in weight management [21]. Also, their diet was high in antioxidants such as vitamin E and carotenes. They consumed more calcium and magnesium, the nutrients associated with bone health [22]. Eating a high amount of fruit and vegetables has been associated with a modest reduction in the development of cardiovascular diseases [23].

Nutrition attitude was significantly associated with smoking, a major health risk factor [24,25]. Adults who considered nutrition very important were 28% less likely to be a smoker. Significant associations between attitude toward the importance of nutrition and exercise habits and television watching practices were also noted. Energy expenditure is an important component in the prevention of overweight and obesity [26].

Prolonged television watching had been associated with low physical activity level and high body mass index in adults [5]. Many researchers have shown a positive association between television watching and obesity and health conditions. Hu et al [27-29] observed that prolonged television watching increased the risk of obesity and type 2 diabetes in men and women. Also, there is a positive association between television viewing and obesity-related anthropometric measurements [30]. The adults who considered nutrition very important, compared with adults who did not consider nutrition very important, were 47% more likely to engage in activities that promoted energy expenditure and 17% less likely to engage in activities that promoted a sedentary lifestyle.

In spite of the above findings, no differences were seen in the mean body mass index values and the percentages of overweight adults in the 2 groups. It is difficult to establish an association between nutrition attitude and weight status because the DHKS is a cross-sectional data. It is a limitation of the study. Also, because of the lack of energy expenditure data, it was not possible to estimate the percentages of adults who were either in positive or in negative energy balance on day 1 and to show an association between nutrition attitude and energy balance.

In addition to nutrition attitude, factors that influenced food buying included taste, food safety, convenience, and price. Taste was considered very important by approximately 80% of adults in both nutrition attitude groups. Food price was important to 40% of adults who considered nutrition very important and to 34% of adults who did not consider nutrition very important. For low-income adults, time and money concerns may be barriers to healthful eating [31,32]. In the study, 67% of adults living in low-income (income below 131% of poverty) households said that nutrition was very important. In spite of food price being very important to relatively more adults who considered nutrition very important, they ate a better quality diet than their counterparts.

Finally, equal proportion of adults in both groups pointed out that there were many dietary recommendations, and it was hard for them to know what to believe. Therefore, nutrition messages and recommendations should be clear and easy to understand. Otherwise, the general public may not find the nutrition guidance useful and less likely to be enthusiastic about adopting dietary recommendations.

5. Conclusion

Overall, this study showed significant links between nutrition attitude and nutritional behaviors and lifestyle. Adults who placed importance on nutrition were more likely to have a healthful lifestyle. The finding is important in interventions aimed at health promotion. Physicians and other health professionals who counsel patients should emphasize the importance of good nutrition. Health interventions aimed to improve healthful lifestyle practices should include a nutrition component. Nutrition and health science researchers, who conduct surveys to assess the overall health-related lifestyle practices of population groups, may include a question on attitude toward the importance of nutrition when buying food. The question may be also used in screening questionnaires to select appropriate study population groups.

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